

## REVISIONAL NOTES ON AUSTRALIAN CARABIDÆ.

PART. iv. THE GENUS *NOTONOMUS*.

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In These Proceedings for 1902 (Vol. xxvii., Part 2), I published "A Revision of the Genus *Notonomus*." At that time the number of species recognised in the genus was seventy-two, and, now, after making due allowances for species added since 1902, and alterations in nomenclature through some species being reduced to the rank of varieties, and others becoming synonyms, the full number will be seventy-four. To these, fifteen new species are added in the present paper, making eighty-nine in all; no doubt there are a considerable number of species still to be discovered.

The Table of species given by me in 1902 was constructed on artificial lines; in the present paper, I have tried to arrive at a better method of classification by the use of Species-groups. It is evident that the system of groups now adopted still leaves much to be desired, some species being attached to groups to which they have but doubtful affinities. This unsatisfactory result has been caused firstly, by my desire to make few groups; and, secondly, by the extremely intricate manner in which the characters, on which the groups are founded, are diffused generally throughout the genus, owing, no doubt, to their being derived from numerous ancient stems, probably along many lines of descent, so that the relationships of the present-day species present a bewildering labyrinth for the taxonomist to puzzle over. The following characters are useful in attempting to disentangle the relationships of the present-day species.

*Sides of prothorax*, sinuate or not before base; this is not a character of high taxonomic value, but in the *sphodroides*-group it has some importance.

*Posterior marginal puncture of prothorax* — Whether the position of this setiferous pore is actually on the lateral border, or

not, is a very important character. It does not vary in position to the extent of being on the border in the great natural *eques*- and *opacicollis*-groups; nor to the extent of being off the border in the *kingi*-, *lateralis*-, and *lesueuri*-groups. The *violaceus*- and *sphodroides*-groups, as here constituted, can only be differentiated in every case by this feature; and, though no doubt it cannot be affirmed that the difference in the position of this pore is of great importance between such species as *N. opulentus* and *N. besti*, still, this seems a case where, there being a difference, it must be used, on account of the great help it gives in arranging these species.

*Striation of elytra*.—A character of doubtful taxonomic value, though, outside the *chalybeus*-group, only *N. tenuistriatus* and *N. apicalis* have the disc faintly striate; in both these species, the eighth interstice, at least, becomes convex near apex, which it does not in the *chalybeus*-group. *N. sphodroides* is the only species, not belonging to the *chalybeus*-group, in which all the interstices, including the eighth, are depressed at apex.

*Width of eighth interstice*.—Though the relative width of the eighth and ninth interstices of the elytra does not vary in any species, it is not a feature of group-value.

*Tenth interstice*.—The presence of a tenth interstice on the sides of the elytra, near the apical sinuosity, is an ancient character; it seems to have originated outside the ninth interstice, and not to be derived from the ninth interstice. It is found also in other genera besides *Notonomus*. It varies greatly in length and development in *Notonomus*, and has probably progressed towards greater expansion in some species (e.g., *N. kingi*), while in others it has retrograded till it has become almost or quite obsolete (e.g., *N. muelleri* and *N. angustibasis*).

*Basal border of elytra*.—In my Table of 1902, too much importance was attached to whether the humeral angle of the elytra was dentate or not, for, although the form of the basal border at its point of junction with the lateral border hardly varies at all in any species (unless sometimes slightly in a variety), yet it is impossible to define two different forms of the border at the humeral angle, as I attempted to do in 1902; there is every

degree of difference between the uninterrupted form of junction as in *N. rainbowi*, and the strongly dentate form as in *N. eques*.

*Setiferous pores of elytral interstices*.—I look upon it as an ancient character to have the third, fifth, and seventh interstices bearing setiferous pores. These occur in the genus *Ceratoferonia*, and, on the third and fifth interstices, in some of our species of *Trichosternus*; many *Trigonomides* of New Zealand have the seventh interstice punctate. The pluripunctate form of the third interstice is probably older than the bipunctate form. There is undoubtedly a tendency, throughout the genus *Notonomus*, for the number of setiferous pores on the third interstice to be reduced to two, but it cannot be said that the presence of only two punctures necessarily implies relationship between all bipunctate species; though, that there is some taxonomic importance attached to the presence of only two punctures, is impressed on the mind by the fact, that all the species of the *opacicollis*-group and the typical forms of the *kingi*-group are bipunctate; nevertheless, some other characters must be sought for before any near affinity can be recognised between species with the third interstice bipunctate. It may be suggested, as a theory, that the two setiferous pores of the third interstice, which are now the only ones found in so many species, must have been of more economic importance to the species of *Notonomus* than the other pores, such as are now found in *N. pluripunctatus* and many other species; and, therefore, have invariably persisted, while the other pores, being less important, have been lost, so that no species of *Notonomus* has the third interstice of the elytra with less than two punctures, and these similarly placed. Such an hypothesis will account for species, that are not nearly related, having the number of setiferous pores reduced to two, and will also enable it to be understood why a considerable taxonomic value may be attributed to this apparently trivial character in some groups of the genus.

*Prosternum*.—A complete border along the anterior margin of the prosternum is found only in *N. mediosulcatus*; sometimes this feature is fairly well developed in *N. macoiji*, but it is not constant in that species. Having attributed too much importance

to this character in 1902, I was led to describe as a species, under the name of *N. howitti*, what was merely a specimen of *N. macoyi*. — *Intercoxal declivity*: though this is a very important character in *Notonomus*, the shape being constant in every species, it loses its value in the *eques*- and *kingi*-groups; and I can see that too high a value was given to the difference between the rounded and flat forms of the intercoxal declivity of the prosternum in my Table of species in 1902.

*Tarsi*.—The upper surface longitudinally striate occurs only in the *cupricolor*- and *eques*-groups; it is evidently a character of high taxonomic importance. The comparative length of the first joint of the posterior tarsi is a character of importance. The first joint of the four posterior tarsi is furnished, on the outer side, with a longitudinal costa. (This costa is feebly developed in the *chalybeus*-group, and is obsolete in the *mediosulcatus*-group). The external costa of the four posterior tarsi may be spinulose beneath, or not. These spinules may be called the *upper spinules of the outer side*.\* I look upon the presence of these upper spinules as an ancient character. When found on the hind tarsi, they are always present on the middle tarsi; in some species (e.g., *N. violaceus*) they are present, or not, on the hind tarsi, but, in such cases, are always found on the middle tarsi. These upper spinules are a great aid in helping to determine the affinities of many species.—*Onychium*: it is evidently the primitive form for the fifth joint of the tarsi to be setulose beneath; these setules (though usually absent in the species of *Notonomus*) have persisted in species not at all nearly related.

*Setiferous pores of apex of abdomen*.—Usually there are, in the male two, in the female four setiferous punctures at the apex of the abdomen; but throughout the *eques*-group, and in *N. parallelo-morphus*, there are six in the female; the outer seta on each side is placed as is usual in the genus, the two inner ones near

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\* I have noticed in the genus *Eudromus*, from Madagascar, which is evidently an ancient form in the tribe Trigonotomini, that there are two, distinct, continuous rows of spinules on the outer side of the first joint of the hind tarsi. There is no costa, but the upper row of spinules is similarly placed to the upper spinules in *Notonomus*.



together. In the *opacicolis*-group, there are four setiferous pores in the female, but the two on each side are nearer together than usual (the outer one not so far out). The constancy of this apparently trifling character throughout the important *eques*- and *opacicolis*-groups, indicates considerable taxonomic importance for these setæ of the female.

*Colour*.—It may be assumed that black or brown is the primitive colour of the Carabidæ, as it is of the Cicindelidæ; but, although there are now many black species of *Notonomus*, it does not, on that account, seem necessary to suppose that colour had not begun to manifest itself in the division of the tribe Trigonotomini, from which *Notonomus* is derived, before the first *Notonomus* appeared. The evidence, as far as I can weigh it, suggests the belief, that the stem from which *Notonomus* is descended, probably had the upper surface at least partially virescent; and that some forms may have reverted to the primitive carabideous blackness, while others became more and more metallic. If this be so, colour will not be of much use in helping us to determine which of the present-day species most nearly represents the ancient type of the genus.

*Groups*.—The differences between the *cupricolor*-, *eques*-, *satrapus*-, *sphodroides*-, *opacicolis*-, *kingi*-, *lateralis*-, *mediosulcatus*- and *lesueurii*-groups are so decided, that all these groups must be taken to be of ancient origin; of these, the *cupricollis*-, *eques*-, *satrapus*-, *lateralis*-, and *lesueurii*-groups seem the oldest. The question occurs, are all the present-day forms descended from one type? To this question, I can give no answer, for I find it impossible even to guess at how much divergence from a central type into many groups, the relationships between which became more and more attenuated, may have occurred; nor, to what extent convergence from different points along these lines of divergence, and tending in various directions, may have taken place, and helped to jumble the species into the present agglomeration of forms, which now make up the genus *Notonomus*.

To sum up, I suppose that *Notonomus* is not a very primitive type of the tribe Trigonotomini, and that the following characters, none of which probably originated in the genus *Notonomus* (nor

indeed does any single species of the present day show all of them) are ancient characters: head large, prothorax with posterior marginal puncture not on border; elytra fully striate, third, fifth, and seventh interstices bearing setiferous pores, tenth interstice not greatly developed, basal border meeting lateral border at humeral angles without interruption; intercoxal declivity of prosternum rounded in middle; posterior femur considerably swollen on lower side behind apex of trochanter; tarsi with upper surface striolate, first joint of four posterior tarsi costate on outer side, the costa spinulose on lower side, onychium setulose beneath.

\*89. *N. opacistriatus* Sl.—I now see that this species is not a true species of *Notonomus*, but requires a new genus for its reception; therefore, it is not included in *Notonomus* in this paper.

*Species unknown to me.*

23. *N. resplendens* Cast., is closely allied to the species I have named *N. metallicus*; but I have been unable to consider *N. metallicus* the same as *N. resplendens*, on account of its smaller size, and its want of a "beautiful red-gilt margin." I had formed a wrong idea of *N. resplendens* in 1902, and now see that it is not allied to *N. eques* Cast., as I had thought.

35. *N. striaticollis* Cast., seems allied to *N. polli* Sl., but it would be mere guess-work to think these the same; no doubt *N. striaticollis* could be identified, if specimens from the Clarence River were available for examination.

45. *N. depressipennis* Chaud., *vide* Sloane, These Proceedings, 1902, pp.305, 306.

60. *N. darlingi* Cast., I have not seen; it is, perhaps, more allied to *N. australis* Cast., than to *N. nitidicollis* Chaud., the species with which Chaudoir compares it in his "Supplement."

75. *N. subiridescens* Chaud., seems allied to, but different from, *N. liragerus* Sl.

76. *N. ingratus* Chaud. All my attempts to identify this species have failed, nor do I think I have ever seen it; probably it is allied to *N. scotti* Sl.

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\*The numbers prefixed to the names of species throughout this paper, indicate the position in the genus, and correspond with those in the index at the end of the paper.

77. *N. semiplicatus* Cast., (*Pæcilus id.*) should be allied to *N. apicalis* Sl., but it is vaguely described. It was impossible to consider *N. apicalis* the same as *N. semiplicatus*, seeing that the latter is said to have three punctures on the third interstice of the elytra, while the former has only two. Whether *N. semiplicatus* is sufficiently described for its identification to be possible, seems doubtful.

#### Table of Species-groups.

- 1.(30)Episterna of metasternum short.
- 2.(3)Point of prosternum setose between coxæ.....*cupricolor*-group.
- 3.(2)Point of prosternum glabrous.
- 4.(5)Tarsi with upper surface striolate. (Apex of abdomen in ♀ 6-setose)  
.....*eques*-group.
- 5.(4)Tarsi with upper surface not striolate. (Apex of abdomen in ♀ 4-setose; 6-setose only in *N. parallelomorphus*).
- 6.(7)Elytra deeply and fully striate, seventh interstice punctiferous. . . .  
.....*satrapus*-group.
- 7.(6)Elytra with seventh interstice not punctiferous. (Unipunctate in *N. tenuistriatus* and also in some specimens of *N. phytus*).
- 8.(17)Posterior marginal puncture of prothorax not on border.
- 9.(14)Intercoxal declivity of prosternum rounded in middle.
- 10.(11)First ventral segment not bordered on anterior margin behind metepimeron ... ..*sphodroides*-group.
- 11.(10)First ventral segment bordered on anterior margin behind metepimeron.
- 12.(13)Prothorax rounded to base; elytra with humeral angles not dentate.  
.....*excisipennis*-group.
- 13 (12)Prothorax sinuate posteriorly, basal angles rectangular; elytra with humeral angles dentate.....*angustibasis*-group.
- 14.(9)Intercoxal declivity of prosternum flat.
- 15.(16)Third interstice of elytra 4-punctate. . . . .*atrodermis*-group.
- 16.(15)Third interstice of elytra 2-punctate.....*opacicollis*-group.
- 17.(8)Posterior marginal puncture of prothorax on border at basal angle.
- 18.(29)Elytra strongly striate, interstices (including eighth) convex at apex.
- 19.(28)Elytra fully striate.
- 20.(21)Intercoxal declivity of prosternum always rounded; third interstice of elytra always bearing more than two setigerous pores... ..  
.....*violaceus*-group.
- 21.(20)Intercoxal declivity of prosternum usually flat—if rounded, third interstice of elytra bipunctate.
- 22.(27)Posterior tarsi with first joint longer than two succeeding joints together.

- 23.(24) Apex of abdomen in ♀ 6-setose..... *parallelomorphus*-group.  
 24.(23) Apex of abdomen in ♀ 4-setose.  
 25.(26) Elytra with crenulate striæ, third interstice bearing more than two  
       setiferous punctures..... *australis*-group.  
 26.(25) Elytra with simple striæ (only in *N. triplogenioides* crenulate), third  
       interstice bipunctate (in *N. dyscoloides* often with three or four  
       punctures)..... *kingi*-group.  
 27.(22) Posterior tarsi short, first joint not longer than two succeeding  
       joints together... *lateralis*-group.  
 28.(18) Elytra with striæ 1-4 deeply impressed, striæ 5-7 obsolete except at  
       apex..... *mediosulcatus*-group.  
 29.(18) Elytra lightly striate, interstices flat and (including eighth) not  
       convex at apex..... *chalybeus*-group.  
 30.(1) Episterna of metasternum elongate..... *lesueuri*-group.

#### The *cupricolor*-group.

Prothorax with basal angles rectangular; border widely reflexed posteriorly, and passing round angle and on to base as far as lateral basal impressions. Elytra with humeral angles rounded; interstices depressed, third 5-punctate, eighth narrower than ninth. Intercostal declivity of prosternum wide, flat, sparsely setose. Tarsi with joints substriate on upper surface; first joint of four posterior tarsi strongly costate on external side, costa spinulose beneath; fifth joint glabrous beneath.

I have felt compelled to constitute a separate group for 1. *N. cupricolor* Sl., which is probably a primitive form, showing some affinities towards *Rhabdotus*, and also to the *eques*-group of *Notonomus*. It is the only species of *Notonomus* with the point of the prosternum setose; these setæ are about six in number, the two lower ones being well down on the face of the intercostal declivity, looking at the insect when laid on its back. Only the male is known; it will be interesting to find whether the apex of the abdomen in the female has six setæ, as in the *eques*-group, or not.

#### The *eques*-group.

Prothorax with posterior marginal puncture not at basal angle, nor on border. Elytra with basal border more or less dentate at humeral angles, third interstice with more than two punctures. Apical ventral segment in ♂ 2-punctate, in ♀ 6-punctate. Tarsi

with upper surface striolate; four posterior tarsi with basal joint strongly costate on outer side, hind tarsi without spinules below costa of outer side of first joint.

The *eques*-group seems a natural one, probably of ancient origin. It shows slight affinities with the *sphodroides*-group, through *N. strzeleckianus* and allied species; and, also, vaguely towards the *opaicicollis*-group, through *N. eques* and allied species. The *eques*-subgroup has remote affinities towards the *cupricolor*- and *parallelomorphus*-groups. Here, the first joint of the intermediate tarsi has the external costa spinulose on lower side, but in the hind tarsi there is no spinule. *N. eques* and closely allied species have the onychium of the tarsi setulose beneath; and, in *N. froggatti*, too, the onychium may have a single setule on each side beneath, but this is not invariable. *N. strzeleckianus*, *N. phillipsi*, and *N. longus* have the onychium glabrous beneath.

#### Table of Species.

- 1.(6)Intercoxal declivity of prosternum rounded, of mesosternum deeply concave.
- 2.(3)Head and prothorax black (or, at most, with a metallic flush on sides of pronotum near base)..... 2.*N. froggatti* Sl.
- 3.(2)Head and prothorax more or less metallic.
- 4.(5)Pronotum æneous..... 3.*N. strzeleckianus* Sl.
- 5.(4)Pronotum viridescent (also margin of elytra) .. 4.*N. phillipsi* Cast.
- 6.(1)Intercoxal declivity of prosternum flat, of mesosternum hardly concave.
- 7.(14)Tarsi with fifth joint setulose beneath.
- 8.(13)Eyes convex; prothorax with basal angles obtuse.
- 9.(12)Head black.
- 10.(11)Prothorax and elytra black (rarely with greenish flush near sides).  
Size large. (Length, 20-24 mm.)..... 5.*N. bodeæ* Sl.
- 11.(10)Prothorax and elytra with bright cupreous margins.....  
..... 6.*N. rugitarsis* Sl.
- 12.(9)Head virescent. (Prothorax green towards sides, elytra with green margin)..... 7.*N. spenceri* Sl.
- 13.(8)Eyes depressed; prothorax with basal angles marked. (Head, prothorax, and elytra æneous)..... 8.*N. eques* Cast.
- 14.(7)Tarsi with fifth joint glabrous beneath... 9.*N. longus* Sl.

2.*Notonomus froggatti* Sl.,(var. *N. atripennis* Sl.).—I have obtained more specimens of *N. froggatti* (all from the original

locality, Mount Kosciusko), and also more of the form for which I proposed the name *N. atripennis* (from original locality, Mount Buffalo). After examination of this new material, the differences between *N. atripennis* and *N. froggatti* so slight, that I am unable now to consider it a distinct species; I, therefore, sink it to the rank of a variety. The somewhat narrower form (especially of prothorax), absence of a green elytral margin, and less strongly developed humeral angles in *N. atripennis*, though noticeable, do not seem of actual specific value.

#### 4. NOTONOMUS PHILLIPSI Castelnau.

Trans. Roy. Soc. Vict., 1868, p.212; Chaudoir, Ann. Mus. Civ. Genova, 1874, vi., p.580; Sloane, Proc. Linn. Soc. N. S. Wales, 1902, xxvii., p.279.

It seems advisable to offer a description of the species which I identify as *N. phillipsi* Cast. The name is an unfortunate one, in view of the older *N. philippi* Newm.; but I do not venture to change it, owing to the present state of the rules of nomenclature, which seem to countenance as valid, names, no matter how similar to older ones, if differing by a single letter.

♂. Elongate-oval. Head black; prothorax olivaceous with wide æneous-green margins; elytra dark bronze, with ninth interstice and lateral channel green; femora piceous, apex of tibiæ and tarsi reddish. Prothorax subquadrate ( $4.6 \times 5$  mm.), depressed, wider across base ( $3.9$  mm.) than apex ( $3.5$  mm.); sides obliquely narrowed to base without sinuosity; basal angles subrectangular; border wide and strongly reflexed towards base; posterior marginal puncture distant from base in lateral channel; lateral basal impressions deep. Elytra truncate-oval ( $10.7 \times 6.2$  mm.), depressed, strongly declivous to apex, lightly rounded (subparallel) on sides, strongly striate; interstices convex, third 5-7-punctate, tenth feebly developed near apex; lateral apical sinuosities well developed; basal border strongly dentate at humeral angles. Intercostal declivity of prosternum rather narrow and rounded in middle, of mesosternum concave. Tarsi with fifth joint not spinulose beneath. Length,  $16.5$ - $17.7$ ; breadth,  $5.7$ - $6.2$  mm.

*Hab.*—Victoria: Bright (C. French).



Allied to *N. strzeleckianus* Sl., but differing by head smaller; elytra with margin green; interstices more strongly convex, third narrower, not swollen on apical declivity at position of posterior puncture; posterior femora far more strongly swollen in middle of lower side. From *N. rugitarsis* Sl., it differs by colour; prothorax more strongly narrowed to base, basal angles less obtuse; elytra more strongly declivous to apex, humeral angles far more strongly dentate; tarsi with onychium glabrous beneath.

##### 5. NOTONOMUS BODEÆ, n.sp.

Robust, elliptical, parallel. Prothorax quadrate, depressed; basal angles obtuse; posterior marginal puncture distant from basal angle: elytra truncate-oval, strongly striate; interstices convex, third 5-punctate; humeral angles dentate: tarsi with upper surface longitudinally striolate; fifth joint setulose beneath. Black; pronotum sometimes with a faint bronzy tint on posterior part of sides; elytra sometimes with a virescent, or obscurely bronzed border overspreading ninth interstice and lateral channel.

Head moderate in size (4.3 mm. across eyes); eyes convex, prominent. Prothorax broader than long (6 × 6.4 mm.), wider across base (5 mm.) than apex (4.5 mm.); basal angles obtusely rounded; base lightly emarginate in middle; posterior marginal puncture placed considerably before base on inner side of lateral channel; border wide, especially towards base; median line lightly impressed; lateral basal impressions narrow, elongate, lightly arcuate; lateral basal spaces wide, lightly convex. Elytra truncate-oval (13.3 × 7.7 mm.); sides lightly rounded; lateral apical sinuities wide, shallow; interstices convex, in ♂ very minutely shagreened (not opaque), in ♀ finely shagreened and rather dull, eighth interstice convex, wider than ninth, tenth feebly developed; basal border raised and strongly dentate at humeral angles; lateral border widely reflexed. Intercostal declivity of prosternum flat, of mesosternum widely and very lightly concave. Apical ventral segment in ♂ with one, in ♀ with three setigerous punctures on each side. Length, 20-24; breadth, 6.5-7.7 mm.

*Hab.* — N.S.W.: Exeter (H. J. Carter). Colls. Carter and Sloane.

Allied to *N. rugitarsis* Sl., but differing by darker colour; wider prothorax; humeral angles of elytra more strongly marked, etc.

*Note.* — *N. bodece* and *N. rugitarsis* may be varieties of one variable species, but with the materials I have, without any connecting form, I prefer to consider them closely allied, but distinct species. Mr. Carter found this species common at Exeter, and through his kindness I have been able to examine an extensive series of specimens. This species is dedicated to Miss Bode, who first found it.

#### 6. NOTONOMUS RUGITARSIS, n.sp.

Elliptical, parallel, depressed. Prothorax quadrate; basal angles obtuse; posterior marginal puncture distant from basal angle: elytra truncate-oval, strongly striate; interstices convex, third 4- or 5-punctate; humeral angles dentate: tarsi longitudinally striolate on upper surface; fifth joint setulose beneath. Head and under surface black; disc of pronotum and elytra purple-black; pronotum with golden-green or coppery margins on sides and base; elytra with ninth interstice and lateral channel cupreous; tibiae, tarsi, and antennae piceous-red.

Head convex, moderate in size (3.6 mm. across eyes); front strongly bi-impressed behind clypeus; eyes prominent. Prothorax a little broader than long (5 × 5.3 mm.), widest before middle, wider across base (4.2 mm.) than apex (3.8 mm.); sides very lightly rounded, gently narrowed posteriorly; basal angles obtuse; border widely reflexed posteriorly; posterior marginal puncture placed considerably before base on inner side of lateral channel; lateral basal impressions deep, elongate; lateral basal spaces convex. Elytra truncate-oval (11.5 × 6.5 mm.), rather depressed behind scutellum; interstices roundly convex, eighth wider than ninth on basal half, tenth narrow, extending forward to the posterior third of elytra; lateral apical sinuities strongly developed; basal border raised and dentate at humeral angles; lateral border widely reflexed. Intercoxal declivity of prosternum flat, of mesosternum

lightly and widely concave. Male with one, female with three setigerous punctures on each side of apical ventral segment. Length, 20; breadth, 6·5 mm.

*Hab.*—N.S.W.: Eden (H. J. Carter). Colls. Carter and Sloane.

*N. rugitarsis* has the size and facies of *N. eques* Cast.; from which it differs by colour (head not metallic; disc of prothorax and elytra not æneous, and with the lateral margins brightly cupreous); prothorax with basal angles much more roundly obtuse, lateral basal spaces convex; elytra with interstices more convex and much more finely shagreened.

7. *N. spenceri* Sl.—The type-specimen (♀ in my Coll.) is the only one I have seen. It is closely allied to *N. rugitarsis* Sl., but differs by margin of prothorax and elytra green (not cupreous); form more convex; interstices of elytra much less convex (♀), basal border less raised at humeral angles. It has the tarsi with onychium spinulose beneath; apical ventral segment in ♀ 3-setose on each side.

*Note.*—A specimen (♀) ticketed Victoria, has been given to me by Mr. C. French, which differs from *N. spenceri* by elytra more depressed on disc, not margined with green (but becoming a dull coppery colour near sides), interstices more convex. It seems a variety, or perhaps a closely allied species.

#### 9. NOTONOMUS LONGUS, n.sp.

♀. Elongate. Head small: prothorax narrow; basal angles marked; posterior marginal puncture on inner side of marginal channel opposite basal angle: elytra oval, strongly striate; interstices convex, 3-punctate: tarsi striolate on upper surface; fifth joint glabrous beneath. Head and under surface black; pronotum cupreous; elytra obscurely purple, becoming cupreous on sides towards apex, ninth interstice and margin golden-green; legs black, tibiæ, tarsi, and antennæ reddish-piceous.

Head 3·25 mm. across eyes, these convex but not prominent. Prothorax as long as broad (4·7 × 4·7 mm.), subdepressed, lightly rounded on sides, a little wider across base (3·6 mm.) than apex (3·3 mm.); basal angles subrectangular, obtuse at summit; border strongly reflexed on sides behind anterior marginal puncture,

passing round angle on to base on each side; median line decidedly marked; lateral basal impressions elongate, rather shallow; lateral basal spaces widely and lightly convex; marginal channel narrow. Elytra oval ( $10.6 \times 5.7$  mm.), lightly convex, lightly rounded on sides, deeply striate; interstices convex, smooth (not shagreened), eighth wider than ninth, tenth feebly developed; lateral apical sinuities light, wide; basal border strongly raised and dentate at humeral angles; lateral border widely reflexed. Intercoxal declivity of prosternum flat, of mesosternum hardly concave.

♀. With three setigerous punctures on each side of apical ventral segment. Length, 19; breadth, 5.7 mm.

*Hab.*—Victoria: Wood's Point (Sloane). Coll. Sloane.

A single specimen occurred to me at the top of "The Frenchman's Pinch," four miles north of Wood's Point, on the road to Jamieson, December 27th, 1912. From *N. eques* Cast., it may be readily distinguished by its narrower form; prothorax longer, with narrower marginal channel; elytra with interstices not shagreened. It resembles *N. phillipsi* Cast., (as identified by me) but differs by form more elongate; prothorax longer, narrower at base, differently coloured, basal angles more strongly marked, lateral basal spaces more convex; intercoxal declivity of prosternum flat, of mesosternum hardly concave.

#### The *satrapus*-group.

Head large. Prothorax subcordate, wider at apex than at base; basal angles obtuse; posterior marginal puncture in marginal channel (in *N. satrapus* considerably before basal angle, in *N. pluripunctatus* at the obtuse basal angle). Elytra with basal border not raised at humeral angles; interstices convex, third and seventh bearing setigerous punctures (sometimes, also the fifth), eighth wider than ninth at basal third. Intercoxal declivity of prosternum narrow and rounded in middle. First joint of four posterior tarsi with an external costa, the costa spinulose on lower side.

The *satrapus*-group is evidently an ancient one, judging by the setigerous punctures of the seventh interstice of the elytra. This

character is also found in the Australian genus *Ceratoferonia*, and some of the large Trigonomides from New Zealand. Both species are from the mountains to the north of Gippsland, but I do not know a definite locality for either. They may be distinguished thus:—

Black; prothorax not ampliate at widest part; tarsi with onychium spinulose beneath..... 10. *N. satrapus* Cast.

Prothorax and elytra bronzy; prothorax ampliate at widest part; onychium glabrous beneath ..... 11. *N. pluripunctatus* Sl.

*N. pluripunctatus* Sl. After seeing some specimens of this species, and comparing the female with *N. satrapus* Cast., I confirm its validity.\* One specimen has the fifth elytral interstice without punctures on one side.

#### The *sphodroides*-group.

Prothorax with posterior marginal puncture not on border. Elytra with basal border not dentate at humeral angles; third interstice bearing more than two punctures; eighth wider than ninth. Intercoxal declivity of prosternum rounded.

This group forms part of the main body of the genus, and can hardly be separated from the *vialaceus*-group, except by not having the posterior marginal puncture of the pronotum on the border at the basal angle. In the *sphodroides*-group, the four posterior tarsi have the first joint always costate. In *N. peroni*, *N. sphodroides*, *N. muelleri*, *N. angulosus*, *N. politulus* and *N. tubericaudus*, there is no spinule beneath the costa; in *N. kosciuskoanus*, the intermediate tarsi have the costa spinulose beneath, the posterior being non-spinulose; in *N. plutus*, *N. tenuistriatus*, *N. opulentus*, *N. metallicus*, *N. variicollis*, *N. carteri*, *N. arthuri*, and *N. taylori*, the first joint of the tarsi is spinulose, though sometimes the costa of the posterior tarsi is not spinulose in *N. variicollis*.

#### Table of Species.

- 1.(18)Pronotum with lateral channel wide and depressed near base.
- 2.(11)Prothorax truncate-cordate, hardly or not wider at base than apex.
- 3.(10)Head large; interstices of elytra convex near apex (not convex at apex in *N. tenuistriatus*).

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\* These Proceedings, 1903, p.602.

- 4.(7)Posterior marginal puncture of prothorax in lateral channel a little before basal angle.
- 5.(6)Elytra strongly striate; head metallic ..... 12.*N. plutus* Cast.
- 6.(5)Elytra faintly striate; head black..... 13.*N. tenuistriatus* Sl.
- 7.(4)Posterior marginal puncture of prothorax at basal angle.
- 8 (9)Anterior tarsi with three basal joints not dilatate or squamulose beneath in ♂ ..... 14.*N. peroni* Cast.
- 9.(8)Anterior tarsi with three basal joints dilatate and squamulose beneath in ♂ .. ..... 15.*N. muelleri* Sl.
- 10.(3)Head small; interstices of elytra depressed at apex.....  
..... 16.*N. sphodroides* Dej.
- 11.(2)Prothorax subquadrate, decidedly wider at base than apex.
- 12.(17)Upper surface depressed; prothorax with sides oblique towards base.
- 13.(14)Basal angles of prothorax rectangular..... 17.*N. angulosus* Sl.
- 14.(13)Basal angles of prothorax obtuse.
- 15.(16)Third interstice of elytra ordinary. .... 18.*N. politulus* Chaud.
- 16.(15)Third interstice of elytra greatly swollen at position of posterior marginal puncture..... .. 19.*N. tubericaudus* Bates.
- 17.(12)Upper surface convex ; prothorax with sides strongly rounded towards base. (Posterior marginal puncture more distant from base than usual)..... .. 20.*N. kosciuskoanus* Sl.
- 18.(1)Pronotum with lateral channel narrow at basal angle and extending to lateral basal impression.
- 19.(26)Prothorax with basal angles marked.
- 20.(23)Head and pronotum metallic.
- 21.(22)Posterior marginal puncture of prothorax at basal angle.....  
..... 21.*N. opulentus* Cast.
- 22.(21)Posterior marginal puncture of prothorax a little before basal angle  
..... 22.*N. metallicus* Sl.
- 23.(20)Head and pronotum black.
- 24.(25)Size large (16-21 mm.); prothorax lightly rounded on sides and lightly narrowed to base; elytra with eighth interstice convex.....  
..... 24.*N. variicollis* Chaud.
- 25.(24)Size small (13 mm.); prothorax strongly rounded on sides and decidedly narrowed to base; elytra with eighth interstice depressed...  
..... 25.*N. carteri* Sl.
- 26.(19)Prothorax with basal angles rounded off.
- 27.(28)Prothorax subcordate..... 26.*N. arthuri* Sl.
- 28.(27)Prothorax short, widest at middle, strongly and evenly rounded on sides..... 27.*N. taylori* Sl.

12.*N. plutus* Cast.,(= *N. frenchi* Sl.).—I collected numbers of a species of *Notonomus*, identical with that on which I founded



*N. frenchi*, at Warburton, on the Upper Yarra. I have no hesitation in referring these Warburton specimens to *N. plutus* Cast. Sometimes there are two punctures on the fifth interstice of the elytra, sometimes one, and sometimes none.

*Hab.*—Victoria: Warburton and Marysville, in damp, heavily timbered gullies.

*N. cræsus* Cast.—Specimens given to me by Mr. C. French, as from the Baw Baw Mountains, are probably *N. cræsus*. Chaudoir thought that *N. cræsus* Cast., and *N. plutus* were merely forms of one species; and, if I am right in my identification of *N. cræsus*, I concur. The form I take to be *N. cræsus* is differentiated from *N. plutus* by prothorax less strongly sinuate before base, basal angles less decidedly marked; elytra more deeply striate and less brightly coloured.

### 13. NOTONOMUS TENUISTRIATUS, n.sp.

♀. Elliptical, depressed. Head large; prothorax truncate-cordate; sides sinuate before base; basal angles rectangular; posterior marginal puncture in lateral channel a little before base: elytra lightly striate; interstices depressed, third 4-punctate, fifth 2-punctate, seventh 1-punctate.\* Nitid; head black; prothorax nigro-chalybeous; elytra chalybeous, sometimes with purple flush towards sides; legs and antennæ piceous-black.

Head large (4 mm. across eyes), mandibles decussating, frontal impressions shallow, eyes convex. Prothorax broader than long ( $4.3 \times 5.1$  mm.), wider at apex (4.2 mm.) than base (3.6 mm.); sides rounded on anterior three-fourths, lightly sinuate at posterior fifth; anterior angles roundly obtuse; basal angles rounded at summit. Elytra depressed, oval ( $11 \times 6.7$  mm.), widest a little behind middle; lateral apical sinuosities well developed; basal border joining lateral border at humeral angle without interruption; striæ lightly impressed on disc, sixth and seventh obsolete, except towards apex; interstices depressed, eighth convex towards apex, tenth short. Intercoxal declivity of prosternum rounded in middle, of mesosternum concave. Length 19, breadth 6.7 mm.

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\* This puncture is sometimes lost.

*Hab.*—Victoria: Neerim. Type in National Museum, Melbourne.

A very distinct species, with affinities towards *N. plutus* Cast.; from which it differs by colour; striæ of elytra more lightly impressed, etc. It is hardly more strongly striate than *N. philippi* Newm., which it resembles in colour of elytra. The elytra are not firmly soldered together. This species evidently gives a hint of the ancient form, from which the *chalybeus*-group is descended. Three specimens (♀) have been examined.

Var. *reticollis* n. var.—Other specimens given to me by the late Mr. W. Kershaw (and also in the National Museum, Melbourne) are darker in colour, but equally polished; they also differ by having the prothorax more strongly sinuate on sides posteriorly, basal angles rectangular; striæ of elytra still more feebly impressed. This form is probably a closely allied species rather than a variety, but, owing to its exact locality being unknown, and the likelihood of connecting forms being found, I prefer, with the materials before me, (four specimens, ♂♀) to regard it as a variety of *N. tenuistriatus*.

14. *N. peroni* Cast.—A variable species, widely spread in the mountains of Victoria eastward from Melbourne. The following varieties may be noted:—

A. Viridescent, legs black. Eastern Gippsland (French).

B. Viridescent, legs reddish. Marysville (Sloane).

C. Cyaneous, elytra flushed with purple. Ferntree Gully and Warburton (Sloane).

D. Black. Bright (French).

16. *N. sphodroides* Dej.—In my Revision of 1902, I was altogether mistaken about this species, and identified a form of *N. dyscoloides* Motsch., as *N. sphodroides*. It is now apparent to me that *N. sphodroides* Dej., is the same as the viridescent species from the Otway Ranges, which, in my Revision, is placed as a variety of *N. accedens* Chaud.

Var. *accedens* Chaud., (= *N. pristonychoides* Motsch.).—I have only one specimen that can be referred to *N. accedens* Chaud., viz., the one described in my Revision under *N. accedens*. I consider, still, that *N. pristonychoides* Motsch., is conspecific with *N. accedens*,

though my specimen differs from the description of *N. pristonychoides* by having the third interstice of the elytra bipunctate, not tripunctate; but in my specimens of *N. sphodroides*, the number of punctures varies from two to as many as four.

17. *NOTONOMUS ANGULOSUS*, n sp.

♂. Oval, subdepressed. Prothorax subquadrate; basal angles rectangular; posterior marginal puncture at inner side of basal border near basal angle; elytra fully and deeply striate; interstices convex, third 2-punctate, eighth lightly convex, wider than ninth; humeral angles edentate. Black.

Head large (3.5 mm. across eyes); eyes convex. Prothorax broader than long (4 × 4.5 mm.), wider across base (3.8 mm.) than apex (3.5 mm.), depressed towards base; sides lightly rounded on anterior two-thirds, straightened posteriorly to meet base at right angles; border rather strongly reflexed, equal, hardly indicated on sides of base; lateral channel not reaching base; median line well marked; lateral basal impressions elongate, wide, sulci-form at bottom; lateral basal spaces depressed near basal angles. Elytra truncate-oval (10 × 6 mm.), lightly longitudinally depressed along course of third interstice; lateral apical declivities well developed, tenth interstice hardly indicated. Intercostal declivity of prosternum rounded in middle. Tarsi: anterior with three basal joints in ♂ dilatate and squamulose beneath; four posterior with first joint costate externally without spinules beneath costa. Length 16, breadth 6 mm.

*Hab.*—Victoria. Type(unique) in National Museum, Melbourne, ticketed "Gippsland."

A very distinct species, resembling *N. peroni* Cast., in the shape of the prothorax. The elytra are like those of *N. tubericaudus* Bates, but the third interstice is not swollen at position of posterior puncture. It is allied to *N. politulus* Chaud., and *N. tubericaudus* by form of elytra, intercostal declivity of prosternum, and external side of first joint of the four posterior tarsi.

19. *N. tubericaudus* Bates.—Easily identified; being the only species with the third interstice strongly protuberant near apex. It

may be noted that in ♀, the border of the elytra has, on each side, a rather prominent triangular projection just behind the lateral apical sinuities, a character found nowhere else in the genus.

21. *N. opulentus* Cast., (= *N. bassi* Sl.).—I now perceive that, through not knowing *N. resplendens* Cast., the species with which Chaudoir compared *N. opulentus* in his "Supplement," of 1874, I identified *N. opulentus* Cast., wrongly in my "Revision." This error is regrettable, because I was thereby led into describing as new, under the name of *N. bassi*, what is evidently merely a form of *N. opulentus*, a species subject to considerable variation.

Var. *gippslandicus* Cast.—Chaudoir thought this only a form of *N. opulentus*, and I believe he was right. It is distinguished by its green colour. *Hab.*—Marysville (Sloane).

## 22. NOTONOMUS METALLICUS, n.sp.

Elliptical-oval, convex. Prothorax narrow; base and apex of equal width (3.15 mm.); basal angles obtuse; posterior marginal puncture in marginal channel a little before the basal angle; elytra oval, strongly striate; third interstice 4-punctate; basal border joining lateral border without interruption at humeral angles. Head black; prothorax and elytra of a metallic copper-colour; femora black, tibiae and tarsi reddish-piceous.

♂. Head small (3.15 mm. across eyes); eyes prominent. Prothorax longer than broad (4.7 × 4.5 mm.), lightly narrowed to base; sides lightly rounded, obliquely narrowed to base; basal angles obtuse; base arcuate on each side; border narrow, extending round basal angles on to base on each side; median line well marked; lateral basal impressions elongate, deep. Elytra oval (10 × 6.1 mm.), lightly rounded on sides; lateral sinuities of apex wide, but rather deep; interstices convex, eighth depressed, wider than ninth, tenth short and feebly developed. Intercostal declivity of prosternum narrowed in middle, of mesosternum strongly concave. Tarsi with onychium glabrous. Length 17.3, breadth 6.1 mm.

*Hab.*—N.S.W.: Bega. Colls., Carter and Sloane. (Given to me by Mr. H. J. Carter, as from Bega.)

This species is a little smaller than the measurements given by Chaudoir for *N. resplendens* Cast., and has not the margin of the elytra "of a beautiful red-gilt tinge," as said by Castelnau; otherwise it seems to agree better with Chaudoir's note on *N. resplendens* than any other species I know. No species that I have seen agrees thoroughly with the descriptions of *N. resplendens*. Judging from Chaudoir's remarks, that the lateral borders of the prothorax and elytra are narrower and less reflexed in *N. opulentus* than in *N. resplendens*, it would appear that *N. metallicus* has these borders too narrow for it to be *N. resplendens*.

#### The *excisipennis*-group.

Prothorax strongly rounded to base on sides; basal angles rounded; posterior marginal puncture distant from basal angle, not on border. Elytra fully striate; basal border not raised above lateral border at humeral angles; third interstice with two or three setigerous pores, eighth and ninth narrow, convex. First ventral segment bordered on external side, and behind metasternal episterna. Intercostal declivity of prosternum rounded. Tarsi not striolate on upper surface; four posterior with first joint costate externally, costa not spinulose beneath; onychium glabrous beneath.

The affinity of the *excisipennis*-group seems towards *N. angustibasis* Sl., and the position of both these groups in the genus is doubtful. Two species have been described, which may be differentiated as under:—

- Elytra very strongly sinuate on each side of apex;  
     prothorax with sides flushed with purple..... 28. *N. excisipennis* Sl.  
 Elytra not unusually deeply sinuate on each side of  
     apex; prothorax black..... 29. *N. johnstoni* Sl.

#### The *angustibasis*-group.

Prothorax strongly sinuate on sides posteriorly; basal angles strongly marked; posterior marginal puncture distant from basal angle, not on border. Elytra fully striate; humeral angles dentate; third interstice with two setigerous pores. First ventral segment bordered on external side, and behind metasternal episterna. Intercostal declivity of prosternum rounded. Tarsi not striolate on upper surface; first joint of four posterior costate externally; costa

of intermediate spinulose beneath, of posterior very rarely with a single spinule; onychium glabrous beneath.

This group consists of one species, 30, *N. angustibasis* Sl., which is so distinct from all other described species, that I have felt compelled to constitute a group for its reception. It is variable in colour and facies, and is found in the coastal districts, from the Hunter to the Burnett River. I note the following varieties:—

A. Wider than type-form; prothorax much wider ( $5.5 \times 5.4$  mm.); Black. Length, ♀, 21 mm. *Hab.*, Tambourine Mountain. Given to me by Mr. R. Illidge.\*

B. Smaller than type-form; prothorax narrower ( $4 \times 3.5$  mm.); elytra obscure purple-black. Length, 16 mm. *Hab.*, Bathurst. Given to me by Mr. F. H. Taylor.

#### The *atrodermis*-group.

Black. Head large. Prothorax subcordate; posterior marginal puncture in lateral channel near basal angle. Elytra with humeral angles marked, basal border slightly raised above lateral border at point of junction; third interstice with four setigerous pores; eighth narrower than ninth. Intercoxal declivity of prosternum flat; of mesosternum hardly concave. Tarsi with upper surface not striolate; four posterior tarsi with first joint costate externally, costa not spinulose beneath; onychium glabrous beneath.

31. *N. atrodermis* Sl., (1903) [= *N. rufipalpis* Sl., (not Castelnau), 1902] is a species that is equally out of place in the *sphodroides*- or the *australis*-group according to the system of classification herein adopted. It is found in Victoria, I believe, in the Healesville and Marysville Districts. Length, 15 mm.

#### The *opacicollis*-group.

Prothorax with disc either nitid, or opaque and strigulose; posterior marginal puncture near basal angle, but not on border. Elytra fully striate; basal border prominent at humeral angles; third interstice bipunctate. Intercoxal declivity of prosternum

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\* It is possible that *N. subiridescens* Chaud., may be conspecific with var. A.; this is a subject that requires investigation.



flat. Male with one, female with two, setigerous punctures on each side of apical ventral segment; those of the female near together, the outer one more distant than usual from lateral sinuosity of segment. Tarsi not striolate on upper surface; four posterior with external side costate, costa not spinulose beneath.

This is a satisfactory group, containing no species that seem out of place in it; from a geographical point of view, too, it is compact, occupying a single area in Northern New South Wales and Southern Queensland. The species are numerous, and their classification into species and varieties is a work that can be done only by someone with a full knowledge of the extent to which the leading species vary. Such a species as *N. nitidicollis* Chaud., is evidently variable, but only an accurate knowledge of the range of each form could enable anyone to form a true idea of the value of these variations; my information on the range and distribution is not complete in regard to any species of the group.

#### Table of Species.

- 1.(10)Elytra with eighth interstice depressed and much wider than ninth at middle of course.
- 2.(7)Pronotum transversely striolate.
- 3.(6)Elytra with second, fourth, and sixth interstices foveolate.
- 4.(5)Elytra with interstices 1-6 unequal on basal third (second, fourth, and sixth much wider than alternate ones and depressed, except just near base).....32.*N. tessellatus* Sl.
- 5.(4)Elytra with interstices 1-6 equal on basal third (convex in ♂, depressed in ♀).....33.*N. opacicollis* Chaud.
- 6.(3)Elytra without foveolate interstices.....34.*N. polli* Sl.
- 7.(2)Pronotum nitid, without decided transverse striolæ.
- 8.(9)Size large (20·5 mm.); prothorax shortly sinuate before the strongly marked basal angles... ..36.*N. prominens* Sl.
- 9.(8)Size moderate (13-15·5 mm.); prothorax not sinuate on sides, basal angles obtuse..... ..37.*N. illidgei* Sl.
- 10.(1)Elytra with eighth interstice narrow and convex.
- 11.(22)Pronotum nitid.
- 12.(21)Form ordinary; lateral apical sinuities of elytra ordinary.
- 13.(20)Elytra at least with some metallic or submetallic tints.
- 14.(17)Head and prothorax with more or less metallic tints.
- 15 (16)Elytra with interstices convex and nitid in both sexes..... ..38.*N. nitescens* Sl.

- 16.(15)Elytra with interstices depressed, or subdepressed, and opaque in ♀.  
 .....39. *N. nitidicollis* Chaud.
- 17.(14)Head and prothorax black.
- 18.(19)Prothorax strongly rounded on anterior part of sides, strongly  
 narrowed to base.....40. *N. queenslandicus* Sl.
- 19.(18)Prothorax lightly rounded on anterior part of sides, lightly narrowed  
 to base.....41. *N. planipectus* Sl.
- 20.(13)Colour wholly black.....42. *N. melas* Sl.
- 21.(12)Form narrow; lateral apical sinuosities of elytra deeply excised.....  
 .....43. *N. wilcoxi* Cast.
- 22.(11)Pronotum opaque.....44. *N. discorimosus* Sl.

### 32. NOTONOMUS TESSELLATUS, n.sp.

Oval. Prothorax opaque, transverse; sides shortly subsinuate before base; basal angles marked: elytra oval, striate; interstices unequal, second, fourth, and sixth much wider than the others, foveolate, third 2-punctate, eighth wider than seventh; humeral angles dentate. Head and prothorax black, lateral channel of prothorax virescent; elytra nitid and cupreous in ♂, opaque and dark purple in ♀; margin cupreous in both sexes.

Head small (3.15 mm. across eyes). Prothorax wide (4.15 × 5.25 mm.), depressed, much wider at base (4.3 mm.) than apex (3.2 mm.), transversely striolate and longitudinally shagreened; basal angles subrectangular, obtuse at summit; base emarginate in middle; posterior marginal puncture in marginal channel at basal angle; lateral channel wide; border thick, extending on to base on each side; lateral basal impressions narrow. Elytra wide, oval (10.5 × 6.4 mm.), depressed, strongly rounded on sides, deeply sinuate on each side of apex; first, third, and fifth interstice narrow; second, fourth, and sixth wide, closely covered with irregular impressions (these impressions extending nearly to base); seventh and eighth of nearly equal width (eighth a little wider), ninth very narrow, convex, seriate-punctate. Intercostal declivity of prosternum and mesosternum flat. Length, 17.3; breadth, 6.4 mm.

*Hab.*—Queensland: Tambourine Mountain (H. J. Carter). Colls. Carter and Sloane.

Two specimens, taken by Mr. H. J. Carter, at Tambourine Mountain, in Southern Queensland, are before me. It is closely allied to

*N. opacicollis* Chaud., from which it differs by form wider; prothorax proportionately wider; elytra wider, more oval, interstices less convex, especially the second, fourth, and sixth, which are wide as far forward as the impressions extend (that is, nearly to the base), apical sinuosities strongly developed.

33. *N. opacicollis* Chaud., (= *Orbitus purpureipennis* Motsch., and *Feronia purpureolimбата* Cast.) is evidently a species which varies considerably, and probably includes several races, or subspecies, some of which will probably be recognised under varietal names, when their geographical areas become clearly known. I offer the following notes :—

(1). Specimens from Acacia Creek, N.S.W., (six miles south from the Queensland Railway town, Killarney) vary in length from 14 to 17 mm. Elytra with a cupreous margin in both sexes, interstices with numerous foveoles on apical third; in ♂, of a subæneous-purple; in ♀, of an obscure purple-black; pronotum sometimes wholly black, sometimes tinged with green near basal angles.

(2). Specimens from Dorrigo are very similar to those from Acacia Creek in colour, but do not reach so large a size (15-15·5 mm.). Foveoles on the elytra fewer in number, and not extending so far forward; prothorax usually proportionately shorter, wider, less sinuate on sides near base, and with basal angles less rectangular.

(3). A specimen ticketed "Clarence River, Lea," is black, with merely a faint trace of a metallic margin on elytra. It has the prothorax more strongly sinuate before base, with the basal angles still more sharply marked, than the Acacia Creek specimens. Length, 15·5 mm.

(4). Specimens from Dunoon, on the Richmond River, are larger (16-18 mm.); black, the border of the elytra with merely a faint metallic tinge; prothorax wider than in the Acacia Creek specimens. The foveoles of the elytra extend forward beyond the anterior puncture of the third interstice.

*N. rugosicollis* Sl., now appears to me to be founded on an aberrant form of *N. opacicollis* Chaud., in which the foveoles of

the elytra are wanting. If this form is constant, (only one specimen has yet been reported) it may be regarded as a distinct species, but I now feel doubtful about its constancy.

#### 34. *NOTONOMUS POLLI*, n.sp.

♂. Elliptical, depressed. Prothorax lightly transverse; disc transversely striolate, not opaque; posterior marginal puncture on inner side of marginal channel a little before base: elytra truncate-oval, deeply striate; interstices convex, third 2-punctate, eighth depressed and much wider than ninth on basal half; humeral angles dentate. Upper surface bronzy (head faintly so); legs piceous.

Head 2.1 mm. across eyes. Prothorax depressed, broader than long (2.6 × 3 mm.), wider across base (2.3 mm.) than apex (2.15 mm.); pronotum subnitid, closely covered with fine wavy striolæ; sides lightly rounded, lightly narrowed to base without juxta-basal sinuosity; basal angles obtuse; lateral border and channel wide posteriorly; median line strongly impressed; lateral basal impressions sulciform, elongate, uniting with basal channel at base. Elytra depressed, truncate-oval (6.3 × 3.3 mm.), lightly and evenly rounded on sides, strongly sinuate on each side before apex; interstices convex, 1-5 with summits a little flattened on disc, fifth with a foveiform puncture a little before middle, eighth about as wide as seventh towards base, ninth very narrow, tenth well developed, but short. Length, 11; breadth, 3.3 mm.

*Hab.*—N.S.W.: Richmond River. Unique in Coll. Sloane.

A remarkable species, which differs from all the others of the *opacicollis*-group, by the following characters in conjunction. Small size; pronotum transversely striolate, but not rendered opaque by longitudinal rugæ; eighth interstice of elytra much wider than ninth on basal half, second, fourth, and sixth interstices without foveæ. The well marked puncture of the fifth interstice is a most remarkable character; and, although it occurs on each elytron in my unique specimen, I do not feel sure that it may not be an individual variation rather than a feature of the species. Though *N. polli* seems to give a clue to *N. striaticollis* Cast., I cannot identify it as that species on account of its dif-

ference in colour, and thorax not "considerably longer than broad." This curious little species was among the Carabidæ of the Van de Poll Collection, as from the Richmond River.

### 36. NOTONOMUS PROMINENS, n.sp.

Elongate-oval, robust. Head moderate (3.75 mm. across eyes): prothorax subcordate; sides slightly sinuate before base; posterior marginal puncture a little before base on inner side of lateral channel: elytra deeply striate; interstices convex, third 2-punctate, eighth wide; humeral angles strongly dentate: fifth joint of posterior tarsi with four fine setules beneath. Nitid; prothorax with an obscure cupreous tinge; elytra cupreous (sometimes obscurely so); head, undersurface, and legs black, tarsi, palpi, and antennæ piceous.

Mentum with tooth wide, prominent, truncate at apex. Prothorax broader than long (4.65 × 5.75 mm.), broadest about middle, wider across base (4 mm.) than apex (3.75 mm.); sides lightly rounded, shortly sinuate just before basal angles; anterior angles not prominent, very obtuse, distant from neck; base emarginate in middle, lightly rounded on each side; basal angles marked, obtuse at summit; border reflexed, narrow anteriorly, wide posteriorly, extending on each side to lateral basal impressions, these narrow, deep, parallel; median line strongly impressed. Elytra truncate-oval (11.5 × 6.5 mm.), depressed on disc; apical curve lightly sinuate on each side; basal border strongly raised and prominent at humeral angles; striæ deep, simple; interstices not carinate on apical declivity, tenth moderately developed. Intercostal declivity of prosternum and mesosternum flat. Length, 20.5; breadth, 6.5 mm.

*Hab.*—N.S.W.: Acacia Creek (Sloane). Coll. Sloane.

Two specimens (♂) occurred to Mr. H. J. Carter and me at Acacia Creek (six miles south from the Queensland Railway town, Killarney) in December. It is a member of the *opacicollis*-group, of which it is by far the largest species. The wide, eighth elytral interstice, and smooth prothorax together distinguish it from all the other species of the group, except *N. illidgei* Sl.

37. *NOTONOMUS ILLIDGEI*, n.sp.

Elongate-oval. Head moderate (3 mm. across eyes): prothorax rather long; sides not sinuate; posterior marginal puncture on inner side of marginal channel near basal angle: elytra strongly striate; interstices convex in ♂, depressed in ♀, third 2-punctate, eighth much wider than ninth on basal half. Colour obscure, in ♀, black with a faint subviridescent tinge at sides of pronotum near base; elytra with ninth interstice and lateral channel cupreous; in ♂, head and prothorax with a faint cupreous tinge, elytra obscurely cupreous, lateral channel brightly so.

Prothorax broader than long ( $3.7 \times 4.35$  mm.), broadest about middle, wider at base (3.3 mm.) than apex (3); sides lightly and evenly rounded; anterior angles obtuse, not prominent; base truncate; basal angles obtuse (a little marked); lateral border a little wider towards base than apex, extending on each side to lateral basal impressions, these deep, narrow; median line strongly impressed. Elytra truncate-oval ( $8.4 \times 5.1$  mm.); apical curve lightly sinuate on each side; basal border strongly raised at humeral angles; striae simple; interstices in ♂ strongly, in ♀ lightly convex near apex, tenth short. Intercostal declivity of prosternum flat, of mesosternum hardly concave. Length, 13.5; breadth, 4.8-5.1 mm.

*Hab.*—Queensland: Dalveen (Sloane; December). Coll. Sloane.

Allied to *N. prominens* Sl., from which it differs by its smaller size; prothorax not so strongly rounded on sides, and not sinuate before basal angles, these less strongly marked, and with the border not thickened; onychium of tarsi not setulose beneath, etc. From all other allied species, it differs conspicuously by pronotum not transversely striolate, or by having the eighth interstice of elytra not narrow.

38. *N. nitescens* Sl.—Specimens from Ebor (Tillyard and Cox) are more brightly coloured; and have the prothorax less rounded on sides, less ampliate at widest part, and less strongly narrowed to both base and apex ( $3.5 \times 3.8$ , apex 2.7, base 3.15 mm.). This form, from Ebor, should perhaps be regarded as a variety.



Var. *bellingeri* Sl.—After seeing the specimens mentioned above, I conclude that *N. nitescens* is a species which may vary sufficiently to include my *N. bellingeri*, though this is a point on which more data, than I possess, are needful.

39. *N. nitidicollis* Chaud., (= *Feronia mastersi* Cast., = *F. impressipennis* Cast., = *N. purpureipennis* Macl., = *N. latibasis* Sl.).—I now have specimens which certainly represent *N. viridilimbatus* Cast., and others which are conspecific with *N. purpureipennis* Macl. After comparing these with my types (♀) of *N. latibasis*, and taking into consideration Chaudoir's note on *N. viridilimbatus* in his "Supplement" of 1874, I arrive at the conclusion that *N. latibasis* must be synonymous with *N. nitidicollis*; for *N. viridilimbatus* differs from *N. latibasis* exactly as it is said by Chaudoir to differ from *N. nitidicollis*. A recent examination of the types of *N. purpureipennis* Macl., in comparison with a specimen in my possession, compelled me to the belief that *N. purpureipennis* and *N. latibasis* are one species. Length, 13-15 mm.

Var. *viridilimbata* Cast., (= *Feronia viridimarginata* Cast.).—This form has the facies of the typical form, but the prothorax with sides not subsinuate before basal angles, these angles more obtuse. Length, 15 mm. *Hab.*—Brisbane and Toowoomba (Carter).

Var. *viridicincta* Macl., (= *N. nitidicollis* Sl., Revision, 1902).—Form narrower, prothorax more strongly sinuate at base, basal angles more decidedly marked. Length, 12.5 mm. *Hab.*—Gayndah.

Var. *violaceomarginata* Macl.—I have only a single specimen (♀). It is wider and more depressed, and has the eighth interstice of the elytra a little wider than in var. *viridilimbata* Cast., but I conclude that it should go under *N. nitidicollis* as a variety. It requires further study. Length, 16.5 mm. *Hab.*—Gayndah.

Var. *cyaneocincta* Macl.—*N. cyaneocinctus* Macl., agrees generally with var. *viridilimbata* Cast., but has the basal angles of the prothorax more obtuse. *Hab.*—Gayndah.

Var. *obtusicollis*, n.var.—Specimens (♂♀) from Coombungie (westward from Toowoomba) have been given to me by Mr. C. French. This form has the basal angles of the prothorax more rounded off than var. *cyaneocincta* Mael., with which I have compared it, but could not consider it identical. It differs from var. *viridilimbata* Cast., only by the unusually obtuse basal angles of the prothorax. Length, 15 mm.

41. *N. planipectus* Sl., var. *purpurata*, n.var.—The typical form of *N. planipectus* is from Tambourine Mountain, and is wholly black in colour; but a specimen, with the elytra of a beautiful purple, has been given to me by Mr. H. J. Carter, who took it near Murwillumbah, on the Tweed River. I can detect no other difference, worth noting, except the colour of the elytra, between this form and the typical form; it may well be considered a variety.

43. *N. wilcoxi* Cast.—In my Revision of 1902, I have indicated that I thought *N. subopaceus* Chaud., might prove to be only a variety of *N. wilcoxi* Cast. I have since then received four specimens from Mr. J. A. Kershaw, which agree very well with Castelnau's description of *N. wilcoxi*, and which are certainly not distinct from *N. subopacus*; therefore, I am confirmed in my belief that *N. subopacus* is a variety of *N. wilcoxi*.

#### The *violaceus*-group.

Prothorax with posterior marginal puncture on border at basal angle. Elytra with third interstice bearing more than two punctures. Intercoxal declivity of prosternum rounded.

This group is closely related to the *sphodroides*-group, from which it is differentiated by having the posterior marginal puncture of the prothorax on the border. *N. gippsiensis* and *N. rainbowi* are related to the *sphodroides*-group, and *N. violaceus* to the *australis*-group. Here, the four posterior tarsi may be either with or without spinules beneath the costa of the outer side of the basal joint. *N. æqualis*, *N. bakewelli*, and *N. tillyardi* have no spinule beneath the costa (in *N. tillyardi* the costa itself is obsolete). The other species have spinules beneath

the costa, but, in *N. violaceus*, the spinules are not infrequently wanting on the hind tarsi, and sometimes, though rarely, also on the middle tarsi.

#### Table of Species.

- 1.(12)Prothorax with sides not sinuate before basal angles.
- 2.(9)Prothorax with basal angles obtuse, lateral border not widely reflexed just before basal angles.
- 3.(4)Prothorax suborbiculate, widest about middle, transverse, strongly and evenly rounded on sides, basal angles quite rounded off; black.  
..... 46. *N. rainbowi* Sl.
- 4.(3)Prothorax widest before middle, obliquely narrowed to base.
- 5.(6)Prothorax strongly narrowed to base; black...47. *N. gippsiensis* Cast.
- 6.(5)Prothorax lightly narrowed to base, with at least metallic tints near base.
- 7.(8)Prothorax subquadrate(4·5 × 4·9 mm.); head black, pronotum greenish near lateral basal impressions; elytra black, sometimes with green margin..... 48. *N. æqualis* Sl.
- 8.(7)Prothorax narrow (5·3 × 5·5 mm.); head greenish, pronotum bronzy-green, elytra æneous.....49. *N. banksi* Sl.
- 9.(2)Prothorax with basal angles marked, lateral border strongly reflexed posteriorly.
- 10.(11)Upper surface black.....50. *N. macoyi* Sl.
- 11.(10)Upper surface cupreous or æneous . .....51. *N. besti* Sl.
- 12.(1)Prothorax with sides sinuate near base, basal angles rectangular.
- 13.(16)Elytra with eighth interstice depressed, and much wider than ninth towards base.
- 14.(15)Upper surface more or less metallic... .....52. *N. violaceus* Cast.
- 15.(14)Black.....53. *N. tillyardi* Sl.
- 16.(13)Elytra with eighth and ninth interstices subequal and convex.....  
.....54. *N. bakewelli* Sl.

47. *N. gippsiensis* Cast.—I found this species in Victoria, at Marysville and Jamieson; it is also found at Mount Buffalo and Talangatta.

50. *N. macoyi* Sl., (= *N. howitti* Sl.), varies considerably in size and appearance. The interstices of the elytra are convex in ♂, depressed (rarely a little convex) in ♀. Sometimes, and more often in ♀ than in ♂, the prosternum is bordered along the whole of the anterior margin; in my Revision of 1902, too much importance was attributed to this character. *N. macoyi* occurred to me plentifully at Jamieson, on the upper Goulburn River, last De-

cember; and an examination of the specimens, obtained in that locality, enables me to declare, without doubt, that *N. howitti* Sl., is identical with *N. macoyi*. The tarsi have always the first joint of the intermediate pair costate externally, and with two spinules on the lower side of the costa; in the posterior pair, the first joint is costate externally, and usually, but not always, with a spinule on the lower side of the costa. Dimensions: 14.6-17.5 × 4.7-6.3 mm. *Hab.*—Victoria: Marysville and Jamieson (Sloane).

*Note.*—An error occurs in my original description of *N. macoyi*, where the head is said to be "4.1 mm. across eyes"; the true measurement is 3.1 mm., from a remeasurement of the type-specimen.

51. *N. besti* Sl.—The typical form is found on the mountains of the upper Yarra; it occurred to me at Warburton, in January. Var. *aneodorsis* Sl., differs from the typical form by its brassy-green colour.

### 53. NOTONOMUS TILLYARDI, n.sp.

♂. Elliptical-oval, convex. Head large: prothorax cordate, strongly sinuate on each side near base; posterior marginal puncture on border at basal angle: elytra oval, strongly striate; interstices lightly convex. Black.

Head convex (4.3 mm. across eyes); eyes convex. Prothorax broader than long (4.7 × 5.6 mm.), widest before middle, narrower at base (3.75 mm.) than apex (4.3 mm.); sides strongly rounded on anterior three-fourths, strongly sinuate before base; basal angles strongly marked; border thick on sides, thickened at basal angle to receive posterior marginal puncture, extending along base on each side to lateral basal impression; median line strongly impressed; lateral basal impressions deep. Elytra parallel-oval (11 × 6.8 mm.), convex; lateral apical sinuities hardly marked; third interstice with two or three punctures,\* eighth lightly convex, wider than ninth on basal third, narrow and convex on posterior third, ninth lightly convex, tenth obsolescent; basal and lateral borders meeting at humeral angle with hardly any inter-

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\* In my unique specimen, there are two punctures on the right elytron, three on the left.

ruption. Intercoxal declivity of prosternum narrow in middle, of mesosternum concave. Length, 20; breadth, 6·8 mm.

*Hab.* — N.S.W.: Ebor (Tillyard). Unique in Coll. Sloane.

This large, black species is one of the most distinct in the genus, having the prothorax more strongly sinuate to the base than any other species. It is probably more allied to *N. violaceus* Cast., than to any other species. The anterior tarsi in ♂ are much less dilatate than in *N. violaceus* and *N. triplogenioides*. The four posterior tarsi have the first joint without any spinules beneath the external costa, which is obsolete on the hind tarsi.

#### The *parallelomorphus*-group.

Prothorax as long as broad; posterior marginal puncture on border at basal angle. Elytra simply striate; eighth interstice a little wider than ninth on basal half, ninth narrow. Intercoxal declivity of prosternum wide, flat. Tarsi not striolate on upper surface, first joint of four posterior tarsi costate externally, without spinules beneath costa. Apex of abdomen 6-setose in ♀.

A monotypic group, with relationships to both the *eques*- and *australis*-groups, but which it seems better not to associate with either.

55. *N. parallelomorphus* Chaud., (= *N. opulentus* Sl., Revision, 1902).—I can now see that I made a mistake in considering *N. parallelomorphus* as a synonym of *N. opulentus* Cast., to which it has no particular affinity. This species has the apical ventral segment setose as in the *eques*-group, namely, ♂, 2-setose; ♀, 6-setose. The first joint of the anterior tarsi in ♀ is often squamulose beneath (this also occurs in *N. eques* Cast., and rarely in *N. bodeæ* Sl.); it is so in four out of nine specimens taken by me at Warburton and Marysville, Victoria.

#### The *australis*-group.

Prothorax with posterior marginal puncture on border at basal angle. Elytra with striæ crenulate; third interstice bearing more than two punctures. Intercoxal declivity of prosternum flat. First joint of four posterior tarsi costate externally, without spinules beneath costa.

The species of this group are closely allied to *N. violaceus*, but it has seemed best to constitute a separate group for them.

#### Table of Species.

- 1.(2)Prothorax with sides not sinuate posteriorly, basal angles obtuse.....  
 .....56. *N. colossus* Sl.  
 2.(1)Prothorax with sides sinuate posteriorly, basal angles marked.  
 3.(6)Elytra with humeral angles strongly dentate.  
 4.(5)Size large (21-25 mm.).....57. *N. australis* Cast.  
 5.(4)Size smaller (17-19 mm.).....58. *N. crenulatus* Sl.  
 6.(3)Elytra with basal border not dentate at humeral angles.....  
 .....59. *N. amabilis* Cast.

56. *N. colossus* Sl.—I took this species at Guyra and Ben Lomond, in December, 1910; and I have it also from Uralla.

57. *N. australis* Cast., (= *N. ceneomicans* Chaud.). — In Chaudoir's original description of *N. ceneomicans*, the colour is given as "*plerumque viridimarginata thorace laetiore, plus minusve virescente*," therefore, coloured as Castelnau's *Trigonotoma australis*, with which I believe it to be identical. *Hab.*—Narrara and Ourimbah (Sloane).

*Var. lapeyrousei* Cast., is the form found north of the Hunter River; it has the margins of prothorax and elytra cupreous. *Hab.*—Buladelah (Carter), Dorrig (Tillyard).

58. *N. crenulatus* Sl., is a distinct species, rather than a variety of *N. australis* Cast. The humeral angles, though strongly marked, are not dentate as in *N. australis*, it is also smaller than *N. australis*. Length 17-19 mm. *Hab.*—Dorrig (Sloane), Ebor (Tillyard).

#### The *kingi*-group.

Prothorax with posterior marginal puncture on border at basal angle. Elytra fully striate; third interstice 2-punctate (except in *N. dyscoloides* Motsch., where the number of punctures varies from two to four). Posterior tarsi with first joint as long as the two succeeding joints together; onychium glabrous beneath.

The species, which I have included in the *kingi*-group, are not at all nearly allied to one another, for I cannot suppose that the characters, by which they are associated together, are of great value for indicating close affinities. The Victorian species, *N. dys-*



*coloides* and *N. apicalis* are evidently related to one another, and show some relationship towards *N. minimus*; these three species are rather out of place in the group, but *N. victoriensis* seems to link them with *N. australasiæ*; therefore, I have placed them here to prevent the addition of another, to my already too numerous groups. The two Queensland species are isolated forms. The typical species belong to New South Wales.

#### Table of Species.

##### A. Typical Species.

- 1.(6)Intercoxal declivity of prosternum rounded. (Elytra with humeral angles not dentate).
- 2.(3)Lateral border of pronotum narrow, of elytra narrow near humeral angles; elytra lightly sinuate on each side of apex. (Black.).....61.*N. scotti* Sl.
- 3.(2)Lateral border of pronotum widely reflexed, of elytra widely reflexed near humeral angles; elytra strongly sinuate on each side of apex.
- 4.(5)Black.... 62.*N. fergusoni* Sl.
- 5.(4)Metallic.... 63.*N. marginatus* Cast.\*
- 6.(1)Intercoxal declivity of prosternum flat.
- 7.(10)Elytra with eighth interstice depressed or subdepressed, much wider than ninth towards base.
- 8.(9)Striæ crenulate. (Length 22-24 mm.)....64.*N. triplogenioides* Chaud.
- 9.(8)Striæ simple. (Length 15-17 mm.)... 65.*N. australasiæ* Chaud.
- 10.(7)Elytra with eighth interstice narrow, convex.
- 11.(18)Pronotum nitid.
- 12.(17)Elytra normally striate.
- 13.(14)Form elongate, depressed; pronotum widely margined. (Length 18 mm. Black) .....66.*N. liragerus* Sl
- 14.(13)Form ordinary.
- 15.(16)Prothorax with basal angles marked; elytra with humeral angles strongly dentate.... 67.*N. kingi* MacI.
- 16.(15)Prothorax with basal angles rounded off; elytra with humeral angles marked but not dentate..... 68.*N. leai* Sl.
- 17.(12)Pronotum opaque..... 69.*N. doddi* Sl.
- 18.(11)Elytra with seventh interstice branching into three forward from apical curve.....70.*N. saepestriatus* Sl.

##### B. Victorian subgroup.

Size moderate (12-15 mm.).

- Elytra with third interstice swollen at position of posterior puncture  
 .. 71.*N. victoriensis* Sl.

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\* I now regard *N. sydneyensis* Sl., as a var. of *N. marginatus*.

Elytra with third interstice not swollen at position of posterior puncture.

Elytra strongly striate .....72. *N. dyscoloides* Motsch.

Elytra finely striate, interstices depressed except at apex.....  
.....73. *N. apicalis* Sl.

Size small (9 mm.), colour black.....74. *N. minimus* Sl.

64. *N. triplogenioides* Chaud., var. *jervensis* Sl.—In my Revision of 1902, I described *N. jervensis* as a species distinct from *N. triplogenioides*. Mr. H. J. Carter found *N. jervensis* at Nowra, and an examination of his specimens convinces me that it is only a variety of *N. triplogenioides*.

67. *N. kingi* W. S. Macleay, (= *N. incrassatus* Chaud.).—In These Proceedings for 1907 (p. 365), I suggested that *Pæcilus kingi* W. S. Macleay, might well be taken to be *N. incrassatus* Chaud., and further consideration of the matter makes this conclusion seem inevitable.

#### 69. NOTONOMUS DODDI, n.sp.

Oval. Prothorax subcordate; pronotum opaque, transversely striolate; posterior marginal puncture on border at basal angle: elytra deeply striate; interstices convex, third 2-punctate; inner humeral angles sharply marked: fifth joint of tarsi glabrous beneath. Black.

Head not large (3.2 mm. across eyes). Prothorax broader than long (4.15 × 5 mm.), wider across base (3.6 mm.) than apex (3 mm.); sides rounded, very shortly sinuate just before basal angle; apex widely emarginate; anterior angles obtuse, but rather prominent; base lightly emarginate in middle; basal angles almost rectangular, obtuse at summit; border wide, especially posteriorly; lateral channel wide, becoming wide and depressed near basal angles; lateral basal impressions deep, not long; median line strongly impressed, reaching base. Elytra ovate (9.2 × 5.3 mm.), wide at base, lightly rounded on sides; lateral basal sinuosities well developed, stronger in ♀ than in ♂; basal border a little raised above lateral border at humeral angles; lateral border wide, reflexed; eighth interstice narrower than seventh, about twice as wide as ninth at basal third, tenth well developed. Intercostal declivity of prosternum flat, of mesosternum hardly at all concave. Length, 14-16; breadth, 4.75-5.3 mm.

*Hab.*—Queensland : Herberton District (F. P. Dodd). Coll. Sloane.

An isolated species, at once differentiated from all others by having the pronotum opaque and transversely striolate, and the posterior marginal seta on the border at basal angle.

72. *N. dyscoloides* Motsch., [= *N. sphodroides* Sl., (1902), not Dejean].—A variable species in colour, size, and convexity of elytral interstices, also in the number of punctures on the third interstice; usually there are three or four of these punctures, but small specimens, from Marysville and the Baw Baw Mountains, have only two punctures; the elytra are generally longitudinally depressed along the course of the third interstice. The intermediate tarsi have the external costa of the first joint spinulose beneath, but the posterior tarsi have no spinule beneath the costa. It has not much affinity with any other species of the group in which I have placed it. The species most nearly allied to it seems to be *N. victoriensis* Sl. Specimens with violaceous elytra occurred to me at Warburton and Marysville; doubtless these represent *Pterostichus semiviolaceus* Cast. Length, 12.7-15 mm. Specimens from the Dandenong Ranges have the elytra more cyaneous, and are evidently the form which Castelnau distinguished under the separate name of *Pterostichus victorie*; this is the form I erroneously thought to be *N. sphodroides* Dej., in 1902; the material now before me indicates that this slightly differentiated form is not worthy of a varietal name. Length, 13-15 mm. Specimens from Marysville are smaller, and have the elytra with only two punctures on the third interstice. Three specimens are before me, taken near Keppel's Falls, on the Taggerty River; two of these (♂♀) have the elytra cyaneous, the other (♀) violaceous. It seems a variety. Length, 12-12.5 mm.

Var. *simulans* Chaud.—I have specimens from Victoria which differ from *N. dyscoloides* Motsch., by colour, in the same way that *N. simulans* is said to do; namely, elytra cupreous, with the border black. (It may be noted that *N. dyscoloides* has the border of the elytra black). I look upon my specimens as representing a variety of *N. dyscoloides*, rather than a distinct species. Length, 15 mm.

*Hab.*—Victoria: Emerald. National Museum, Melbourne, and Coll. Sloane.

73. NOTONOMUS APICALIS, n.sp.

Elongate-oval, rather depressed. Prothorax truncate-cordate; basal angles rectangular; elytra on disc feebly, at apex strongly striate; third interstice 2-punctate; humeral angles subdentate. Nitid; head, prothorax, and underparts black; elytra æneo-cupreous, margin black.

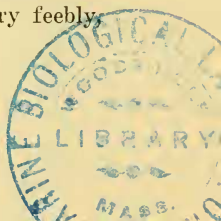
Head 2.4 mm. across eyes. Prothorax broader than long (3 × 3.5 mm.); base and apex of equal width (2.5 mm.); sides lightly rounded, shortly subsinuate just before base; border strongly reflexed posteriorly, continued on to base; posterior marginal puncture on border at basal angle; lateral basal impressions elongate; lateral basal spaces depressed. Elytra oval (7.2 × 4.3 mm.); basal border obtusely raised above lateral border at humeral angles; lateral apical sinuities well developed; striæ lightly or faintly impressed on disc, more distinct near base, strongly impressed on apical declivity; first well marked for whole length, 4-8 obsolete or faintly impressed; interstices flat, except just near apex. Intercostal declivity of prosternum flat, of mesosternum not concave. Four posterior tarsi with external side costate, and spinulose beneath costa. Length 12, breadth 4.3 mm.

*Hab.*—Victoria. National Museum, Melbourne (type), and Coll. Sloane.

I have to thank Mr. J. A. Kershaw for the opportunity of describing this species. It is allied to *N. dyscoloides* Motsch., though it has a superficial resemblance to the species of the *chalybeus*-group. The flat intercoxal declivity of the prosternum, and the elytra strongly striate on the apical declivity, where the interstices are raised, indicate its affinities, and preclude it from being placed in the *chalybeus*-group.

The *lateralis*-group.

Prothorax with posterior marginal puncture on border at basal angle; lateral basal impressions short, not reaching margin of base. Elytra strongly striate; basal border not, or very feebly,



interrupted at point of junction with lateral border; third interstice with three or four punctures, eighth wider than ninth towards base. Four posterior tarsi without spinules beneath costa of external side of first joint; hind tarsi short, first joint not as long as the two succeeding joints together.

Table of Species.

- 1.(2)Elytra with ninth interstice depressed, not much narrower than eighth towards base, tenth hardly developed; tarsi with onychium setulose beneath.....78. *N. cylindricus* Sl.
- 2.(1)Elytra with ninth interstice very narrow, much narrower than eighth towards base; tenth well developed, elongate.
- 3.(4)Elytra with decided lateral apical sinuosities, disclosing apex of inner marginal plica.....79. *N. wentworthi* Sl.
- 4.(3)Elytra with lateral apical sinuosities obsolete, apex of inner marginal plica not visible. (Posterior tibiæ curved) .....80. *N. lateralis* Sl.

78. *NOTONOMUS CYLINDRICUS*, n.sp.

♀. Elongate, subcylindrical. Head large; prothorax subcordate; basal angles rounded; posterior marginal puncture on border at basal angles; elytra parallel, convex, strongly striate; humeral angles edentate; third interstice 4- or 5-punctate. Black.

Head convex (3.8 mm. across eyes); frontal impressions obsolete; clypeus bi-impressed; eyes with orbits reniform; postocular part of orbits well developed. Prothorax broader than long (4.5 × 4.9 mm.), widest before middle, convex; sides slightly rounded, roundly, obliquely narrowed to base; apex (3.9 mm.) wider than base (3.5 mm.); anterior angles not marked; basal angles obtuse; border well developed posteriorly, passing round basal angle to lateral basal impression on each side; lateral basal impressions deep, short; lateral basal spaces convex. Elytra much wider than prothorax (10.8 × 6.2 mm.), very convex; lateral apical sinuosities well developed; interstices lightly convex, eighth a little wider than ninth towards base, tenth hardly indicated. Intercostal declivity of prosternum wide, rounded, of mesosternum concave; metepisterna short. Four posterior tarsi with first joint costate on external side, without spinules below costa; hind tarsi with first joint shorter than two succeeding joints together; fifth joint setulose beneath. Length 18, breadth 6.2 mm.

*Hab.*—Australia: Type (unique) in National Museum, Melbourne, ticketed "Queensland."

A very distinct species, in a general way resembling *N. variicollis* Chaud., but more elongate, convex, and cylindrical, and with the posterior marginal puncture of the prothorax on the border. The short posterior tarsi seem to ally it with *N. lateralis* Sl., and *N. wentworthi* Sl., therefore, I have placed it in the same group as these species, but it does not appear to have more than a general relationship with them. It is readily distinguished from both *N. lateralis* and *N. wentworthi* by having the prothorax more cordate; elytra with basal border less raised at point of junction with lateral border, third interstice 4-punctate, ninth depressed and wider, tenth hardly developed, etc. Though the unique specimen in the National Museum, Melbourne, is ticketed "Queensland," it seems to me a southern form; and, for this reason, I think it possible that the habitat Queensland may have been attached to it, in error.

79. *NOTONOMUS WENTWORTHI*, n.sp.

Robust, parallel. Head large; prothorax subquadrate; basal angles obtuse; posterior marginal puncture on border at basal angle; elytra truncate-oval, strongly striate; interstices convex, third 3-punctate as in *N. lateralis* Sl., eighth wide, ninth very narrow; posterior tarsi short. Black.

Head convex (3 mm. across eyes); eyes (with orbits) reniform, prominent, deeply set in orbits posteriorly. Prothorax broader than long (3.8 × 4.3 mm.), lightly and evenly rounded on sides; apex and base of equal width (3 mm.); apex a little emarginate; basal angles roundly obtuse; lateral border even, narrow, thick; lateral basal impressions wide, short; lateral basal spaces convex. Elytra a little wider than prothorax (8.8 × 4.7 mm.), parallel, rather depressed on disc, strongly declivous on sides and apex; lateral apical sinuities moderately developed; scutellar striae very short; basal border rather prominent, and a little raised above lateral border at humeral angles; tenth interstice narrow, elongate; lateral channel hardly widened near beginning of apical curve. Intercostal declivity of prosternum wide, of mesosternum flat. Length 15.5, breadth 4.7 mm.



*Hab.*—N.S.W.: Blue Mountains (Mount Tomah, Fletcher; Kurrajong, Musson). Coll. Sloane.

In my Revision of 1902, this species was placed under *N. lateralis* Sl., but I now perceive that it is quite distinct. The male of *N. wentworthi* differs from the male of *N. lateralis* by eyes more prominent; elytra with lateral channel much narrower posteriorly, lateral apical sinuosity well developed, and disclosing the apex of the inner plica (in *N. lateralis*, the sinuosity is obsolete, and the inner plica is not visible) posterior tibiæ straight (not incurved on lower side), etc.; in the female, the same elytral differences occur in a far more decided form.

80. *N. lateralis* Sl.—Mr. H. J. Carter found this species at Mount Irvine, in the Blue Mountains; and, after seeing his specimens, it is evident to me that my original description was founded on normal specimens. When writing my "Revision," in 1902, I confused another species (*N. wentworthi*) with *N. lateralis*; this error was caused by my having only one specimen (♀) of *N. lateralis* and *N. wentworthi* for comparison, and I concluded that the very peculiar marginal development of the elytra in *N. lateralis* ♀, (which had been described in the original description of that species) was probably an individual deformity. In this, I was wrong; it is the normal form of the elytra in *N. lateralis* ♀. It may be noted, that what I called the "ninth stria," in the original description of *N. lateralis*, is really the marginal channel; there is a narrow, ninth stria between the ninth and tenth interstices, on the posterior half of the elytra.

#### The *mediosulcatus*-group.

Prothorax rounded on sides; basal angles rounded; posterior marginal puncture on border. Elytra with the four inner striæ deep, 5-7 obsolete, third interstice 2-punctate; humeral angles rounded. Prosternum with anterior margin bordered; intercoxal declivity rounded. Four posterior tarsi with first joint not costate, nor with upper spinules on external side; onychium glabrous beneath.

A monotypic group showing no near affinity to any other group, but with evident suggestions of being a connecting form between *Notonomus* and *Sarticus*.

81. *N. mediosulcatus* Chaud., (= *Adetipa punctata* Cast., = *Omasus occidentalis* Cast., = *O. satanas* Cast.) is the only species as yet known from South-Western Australia; it varies greatly in colour and appearance.\*

#### The *chalybeus*-group.

Prothorax with posterior marginal puncture at basal angle. Elytra feebly striate; interstices depressed (including eighth at apex), third 2-punctate. Intercostal declivity of prosternum rounded. Intermediate tarsi with first joint spinulose on outer side above usual row of external spinules; posterior tarsi often not similarly spinulose, sometimes with one upper spinule, external costa of first joint not well developed, sometimes obsolete; onychium glabrous beneath.

A satisfactory group, for which Motschulsky thought a generic name needful (*Ternox*). Chaudoir did not consider *Ternox* as distinct from *Notonomus*; and it seems to me that, if the separation of *Ternox* had to be supported by valid reasons, such reasons would not be easy to indicate; therefore, I follow Chaudoir in merging *Ternox* with *Notonomus*. This group gives indications of ancient relationships towards the *sphodroides*-group through *N. tenuistriatus* Sl., and also in a more shadowy way towards *N. mediosulcatus* Chaud.

#### Table of Species.

- 1.(4) Colour black.
- 2.(3) Elytra with humeral angles not raised; prothorax evenly rounded on sides, widest about middle ..... 82. *N. gravis* Chaud.
- 3.(2) Elytra with humeral angles strongly raised; prothorax rather obliquely narrowed to base, widest considerably before middle. ....  
..... 83. *N. molestus* Chaud.
- 4.(1) Elytra virescent.
- 5.(6) Size large (17-21 mm.); elytra with basal border very little raised above lateral border at humeral angles. .... 84. *N. philippi* Newm.

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\* Sloane, These Proceedings, 1898, p. 478.

- 6.(5)Size small (13·5-15 mm.); elytra with basal border decidedly raised above basal border at humeral angles.
- 7.(8)Prothorax not sinuate on sides before basal angles. .... 85. *N. chalybeus* Chaud.
- 8.(7)Prothorax lightly sinuate before basal angles.....86. *N. kershawi* Sl.

84. *N. philippi* Newm., (= *Percus bipunctatus* Cast.).—The species which Castelnau named *Feronia (Percus) bipunctata* must certainly be considered to be the same as Newman's *Feronia philippi*, but I cannot now accept Chaudoir's view that it is synonymous with *F. chalybea* Dej., which is a smaller insect. *N. philippi* is common about Melbourne, and is found generally over the Yarra watershed; I have found it at Matlock, on the source of the Goulburn River. Length, 17-21 mm.

Var. *otwayensis* Sl.—Probably this is a distinct species, but more information than I possess of the spread of *N. philippi* westward from Melbourne, and more knowledge as to any intermediate forms being found, would be necessary before any definite opinion could be ventured upon.

Var. *arcuata*, n. var. Differs from *N. philippi* Newm., by size smaller, prothorax more strongly rounded, more roundly narrowed to base; basal angles rounded off, not marked; elytra more obvate, narrower towards base. From *N. gravis* Chaud., it differs by form less convex, elytra more or less chalybeous, more narrowed to base, basal border obtusely subdentate at humeral angles (a little raised above lateral border). Dimensions: head, 3·2 across eyes; prothorax, 3·8 × 4·6, apex 3·1, base 3·2; elytra, 9·7 × 5·8; length 16 mm.

*Hab.*—Werribee Gorge (westward from Melbourne). Colls. Dixon and Sloane.

I owe it to the kindness of Mr. J. E. Dixon, of Melbourne, that I have been able to examine three specimens of this variety, which he had found at Werribee Gorge. It might be considered a species closely allied to *N. philippi*, but I prefer to regard it as a variety of that species.

85. *N. chalybeus* Dej.—This species is found on King Island. Specimens sent to me by Mr. A. M. Lea, from King Island, agree

closely with Chaudoir's description of *N. chalybeus*. It differs from *N. philippi* Newm., by its smaller size. Black, with greenish-blue elytra. Length, 13-14 mm.

86. *N. kershawi* Sl., is extremely near *N. chalybeus* Dej., of which it is the representative on the mainland. It exactly resembles *N. chalybeus* in appearance and colour, but has the prothorax sub-sinuate before the basal angles, which are more strongly marked; the humeral angles of the elytra, too, are more prominent. *Hab.*—Victoria: Princetown (Sloane), Portland (J. E. Dixon).

#### The *lesueuri*-group.

Prothorax with posterior marginal puncture on border at basal angles. Elytra strongly and fully striate; third interstice 2-punctate, eighth and ninth subequal, eighth convex. Intercostal declivity of prosternum flat. Metepisterna longer than is usual in the genus. Four posterior tarsi without spinules beneath costa of external side of first joint; hind tarsi shorter than usual in the genus; onychium glabrous beneath.

This is a terminal group; by its short posterior tarsi, and some other characters, it approaches the *lateralis*-group. The two species may be separated thus:—

Elytra with humeral angles edentate..... 87. *N. lesueuri* Cast.

Elytra with humeral angles dentate..... 88. *N. miles* Cast.

*N. miles*, as identified by me in my "Revision" of 1902, may not be the species which Castelnau described. I am unable to decide that Chaudoir's description of *N. miles* Cast., in his "Supplement," could not have been founded on the species I identified as *N. miles*, but, when we consider that Chaudoir separated *N. lesueuri* from all the other species of *Notonomus*, on account of its elongate metepisterna; and that, in the same paper, he treated of *N. miles* very fully, it seems difficult to think that the true *N. miles* has elongate metepisterna. My present view is, that the true *N. miles* is a species allied to *N. kingi* Macl., and not *N. miles* Sloane, but, to prevent changes in nomenclature on insufficient evidence, I now leave the matter as formerly decided by me,\* till the examination

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\* These Proceedings, 1902, p.323.

of specimens from the Clyde River, N.S.W., enables the point to be settled definitely.

### INDEX AND LIST OF SPECIES.

Names which have an asterisk prefixed to them, are those of species which are unknown to me in nature.

Names which are not noticed in the body of the present paper, are synonyms which have been treated of in my Revision of 1902.

Varieties are indexed here, the same as synonyms, and have the numbers of the species on which they are dependent, attached.

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## ON A CASE OF NATURAL HYBRIDISM IN THE GENUS *GREVILLEA* [N.O. PROTEACEÆ].

BY J. J. FLETCHER.

[Paper withdrawn, by permission of the Council, for the incorporation of observations on some additional material, corresponding with that described by Mr. Benthham in the *Flora Australiensis*, not previously seen.]